REMARKS/ARGUMENTS

Upon entry of the present amendment, claims 1-22 are pending and presented for examination. Claims 1, 13-17 and 21 have been amended. Reconsideration is respectfully requested.

I. FORMALITIES

Support for the amendment to the claims is found throughout the specification as filed. More particularly, support for the amendment to claim 1 is found, *inter alia*, on page 6, lines 18-20 and on page 7, lines 7-11. Support for the amendment to claims 13-14 and 21 is found, *inter alia*, on page 7, lines 18-23 and on page 6, lines 15-17. Support for the amendment to claims 15-17 is found, *inter alia*, on page 7, lines 7-11; and page 9 line 30, bridging to page 10, line 2. As such, Applicants respectfully submit that no new matter is present in this or any other portion of the present amendment.

II. REJECTION UNDER 35 U.S.C. § 112 SECOND PARAGRAPH

The Examiner has rejected claims 1, 13 and 15-17 under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter Applicants regard as the invention. To the extent the rejection applies to the amended set of claims, Applicants respectfully traverse the rejection.

The Examiner alleges that claim 1 is unclear as to how the conductive electrodes are contacted with the sensed material when it is covered with a polymer film. Applicants respectfully point out that claim 1 recites a method for fabricating a *physical apparatus i.e.*, an olfactory sensor. As amended, claim 1 recites a method for fabricating an olfactory sensor on a substrate having a pair of electrodes, said method comprising:

> a) depositing at least one conducting material as a first layer onto said substrate having a pair of electrodes; and
>
> b) depositing at least one non-conductive or insulating polymer film as a second layer onto said first layer of conducting material thereby

fabricating said sensor, wherein said olfactory sensor is comprised of at least one sensor composition.

A general teaching of how a material, *e.g.*, an odorant is "sensed" using an olfactory sensor of the present invention is provided on page 7, line 33, bridging to page 8, line 4, wherein it is described that the chemical analyte is detected after for example, being absorbed by the polymer film of the sensor. In view of the amended claim and the general teaching provided in the specification regarding how such a sensor is used to detect an analyte, Applicants submit that the claim drawn to a method for fabricating an olfactory sensor is clear and definite. As such, Applicants respectfully request that the rejection of claim 1 be withdrawn.

Furthermore, the Examiner alleges that the use of the term "processing" in claim 13 renders the claim indefinite as it is unclear what the term "processing" encompasses and it is allegedly broader than the enabling disclosure. In response, Applicants have amended claim 13 to replace the term "processing" with "post-processing". The term "post-processing," as a step in the preparation of an olfactory sensor is clearly defined in the specification, in particular on page 9, lines 26-29, wherein it is described that after the polymer film is deposited, the polymer may be further transformed or "post-processed" by for example, cross-linking, curing or photo-polymerization. As the term post-processing is clear and definite, Applicants submit that the recitation of the term post-processing renders the claim definite. As such, Applicants respectfully request that the rejection of claim 13 be withdrawn.

Finally, with respect to claims 15-17, the Examiner alleges that the claims are confusing as it is unclear how a first and a second sensor is formed when there is only one deposition step. Claim 1 has been amended and now sets forth a method for fabricating an olfactory sensor on a substrate having a pair of electrodes comprising:

a) depositing at least one type of conducting material as a first layer onto said substrate having a pair of electrodes; and

b) depositing at least one type of non-conductive or insulating polymer film as a second layer onto said first layer of conducting material thereby fabricating said sensor, wherein said olfactory sensor is comprised of at least one sensor composition.

With respect to claim 1, it is clear that more than one type of conducting material may be applied as a first layer and more than one type of a polymer film may be applied as a second layer over the first layer, thereby making an olfactory sensor that has at least one, and possibly more, different sensor compositions. In view of the amendments to the claims, Applicants submit that claims 15-17 that describe preferred embodiments of the invention, wherein the olfactory sensor of the present invention comprises two compositionally different sensors on a single substrate are clear and definite. As such, Applicants respectfully request that the rejection of claims 15-17 be withdrawn.

III. REJECTION UNDER 35 U.S.C. § 112 FIRST PARAGRAPH

The Examiner has rejected claims 1-22 under 35 U.S.C § 112 as being based on a disclosure that is allegedly not enabling because the specification does not disclose what type of sensor is being formed and what is being "sensed". In addition, the Examiner has rejected claims 1-22 as allegedly the specification does not reasonably provide enablement for every type of sensor known. To the extent the rejection applies to the amended set of claims, Applicants respectfully traverse the rejection.

Applicants have amended claim 1 to recite a preferred sensor of the present invention, *i.e.*, an olfactory sensor. The specification teaches olfactory sensors are preferably incorporated in an olfaction device for use as an electronic nose (*see*, page 11, lines 12-14). The specification also teaches that olfactory sensors are capable of detecting and identifying a particular chemical or odorant present in a gas, vapor, or liquid composition (*see*, page 1, lines 12-16). More details regarding the types of chemicals that are amenable to detection or "sensing" using an olfactory sensor of the present invention are provided on page 11, lines 22-28, which include alkanes, alkenes, alkynes, dienes, alicyclic hydrocarbons, arenas, alcohols, ethers, ketones, aldehydes, microorganisms, bacteria, viruses, isoprenes, and the like. As such, Applicants submit that the present claims, which recite a method for fabricating an olfactory sensor are fully enabled by the detailed teaching provided in the specification and as such, Applicants respectfully request that the rejection of claims 1-22 be withdrawn.

IV. REJECTION UNDER 35 U.S.C. 102(b)

The Examiner has rejected claim 1 as allegedly being anticipated by U.S. Patent No. 5,576,879 ("Yamagishi"), U.S. Patent No. 4,454,007 ("Pace") and U.S. Patent No. 2,296,819, ("Kuroiwa"). The Examiner alleges that Yamagishi, Pace and Kuroiwa all teach sensors whereby conductive electrodes are covered and connected by a conductive material as is taught in the present invention. To the extent the rejection applies to the amended set of claims, Applicants respectfully traverse the rejection.

As amended, claim 1 recites: a method for fabricating an olfactory sensor on a substrate having a pair of electrodes comprising:

> a) depositing at least one conducting material as a first layer onto said substrate having a pair of electrodes; and
>
> b) depositing at least one non-conductive or insulating polymer film as a second layer onto said first layer of conducting material thereby fabricating said sensor, wherein said olfactory sensor is comprised of at least one sensor composition.

Yamagishi describes a sensor for detecting volatile compounds, wherein the sensor has only **one conductive polymer layer** coating the electrodes on the sensor.

Claim 1 of Yamagishi recites:

> The invention claimed is a sensor for reversibly detecting target volatile material in the gas phase comprising:
>
> a) a dielectric substance having a major surface;
> b) a pair of electrically conductive electrodes disposed on the major surface of said substrate; and
> c) **a conductive polymer** covering said electrically conductive electrodes, said conductive polymer doped with appropriate dopants, said dopants present in said conductive polymer in measurable excess of that stoichiometrically required to change said conductive polymer from a neutral state to a charged state to provide requisite conductivity, said sensor being capable of detecting the presence of said target volatile material at a concentration of less than about 500 ppm, wherein said dielectric substance is deactivated by a surface treatment means that enhances the hydrophobicity on surface of said substrate.

In sharp contrast, the present invention teaches a method for fabricating an olfactory sensor comprising **two** distinct layers, 1) a conductive material layer and 2) a non-conducting/or insulating polymer layer that cover a pair of electrodes. Yamagishi simply does not teach or suggest an olfactory sensor comprising two layers, a conductive material layer and a non-conducting/insulating polymer, as does the present invention. Yamagishi only describes a sensor having **one** conductive polymer layer. As such, Applicants submit that Yamagishi does not anticipate the present invention and respectfully request that the rejection be withdrawn.

Pace discloses an ion selective layered sensor for detecting **inorganic ions** in a liquid (*see*, column 2, lines 1-5, Pace). The sensor is composed of a sensing half-cell and a reference half-cell. The sensing half-cell is comprised of **four** different layers including:

a) an inert insulating substrate having coated thereon,

b) a layer of conductive material having coated thereon,

c) a layer of carbon dispersed in a dielectric polymer, the layer being coated with,

d) an ion selective membrane.

In addition to the above layers, the reference half cell also comprises a salt bridge (*see*, Abstract and claim 1, Pace).

In stark contrast, the present invention teaches a method for fabricating an olfactory sensor comprising **two** layers, 1) a conductive material layer and 2) a non-conducting/ or insulating polymer layer that cover a pair of electrodes on a sensor substrate. Pace's sensor is focused on detecting inorganic ions. As such, Applicants submit that Pace simply does not teach an olfactory sensor having **two** layers as is presently claimed.

Moreover, none of the sensor layers in Pace are non-conducting/or insulating as is taught in the present invention. Applicants submit that Pace does not teach or suggest the present invention. As such, Applicants respectfully request that the rejection of claim 1 in view of Pace be withdrawn.

Finally, Kuroiwa teaches a device for detecting moisture. The moisture sensitive device comprises two electrodes vertically stacked on an insulating substrate, which are

separated by a moisture sensitive film. Kuroiwa's invention is shown in Figure 1 and described on column 3, lines 5-44. As shown in Figure 1, the moisture sensitive device of Kuroiwa is comprised of a lower electrode 2 set on an insulating substrate 1. Above the lower electrode is the upper electrode 4 and *sandwiched between the lower and upper electrodes* is the moisture sensitive polymer 3.

In sharp contrast, Applicants teach fabricating an olfactory sensor that can detect an analyte. Applicants' method of fabricating an olfactory sensor on a substrate having a pair of electrodes comprises:

> a) depositing at least one conducting material as a first layer onto said substrate having a pair of electrodes; and
>
> b) depositing at least one non-conductive or insulating polymer film as a second layer onto said first layer of conducting material thereby fabricating said sensor, wherein said olfactory sensor is comprised of at least one sensor composition.

Kuroiwa simply does not teach or suggest the claimed features of the present invention. In one aspect, Kuroiwa describes a moisture sensor device in which the electrodes are **vertically stacked**. In another aspect, Kuroiwa discloses that the moisture sensor device comprises a single layer of a moisture sensitive polymer sandwiched between two electrodes. In more elaborate versions of the moisture sensor device, Kuroiwa describes that the device can have multiple moisture sensitive polymer layers sandwiched between multiple sets of electrodes. However, Kuroiwa simply does not teach or suggest an olfactory sensor of the present invention that being, an olfactory sensor comprising two layers, a conductive material layer and a non-conducting/insulating polymer film layer. In view of the above, Applicants submit that Kuroiwa simply does not teach or suggest the present invention and respectfully request that the rejection in view of Kuroiwa be withdrawn.

V. REJECTION UNDER 35 U.S.C § 103(a)

The Examiner has rejected claims 2-22 under 35 U.S.C. 103(a) as allegedly being obvious over Yamagishi (U.S. Patent No. 5,756, 879), Pace (U.S. Patent No. 4,454,007) or

Kuroiwa (U.S. Patent No. 5,296,819). To the extent the rejection applies to the amended claims, Applicants respectfully traverse the rejection.

As set forth in M.P.E.P. § 2143:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

1. There is No Suggestion or Motivation to Modify the References

As the Examiner is aware, obviousness can only be established by combining or modifying the teachings of the prior art to product the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed.Cir. 1988); *In re Jones*, 958 F2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Applicants submit that the cited art references simply do not teach or suggest the present invention. Yamagishi only describes a sensor having **one** conductive polymer layer. Pace discloses *a sensor for detecting inorganic ions in a liquid sample* substantially consisting of *four layers*:

a) an inert insulating substrate having coated thereon,

b) a layer of conductive material having coated thereon

c) a layer of carbon dispersed in a dielectric polymer, the layer being coated with,

d) an ion selective membrane.

In addition to the above layers, the reference half cell also comprises a salt bridge (*see*, Abstract and claim 1, Pace). The Examiner alleges that Pace teaches covering the electrode layers with a polymer film as is taught in the present invention (*see*, column 8, line 20-40, Pace).

Pace discloses that, in addition to the above four layers, a protective layer, preferably made of glass (but may also be a polymeric) is printed over the conductive material layer (*see*, column 8, lines 29-39, Pace). The protective layer plays an auxiliary role mainly serving as the physical barrier between the conductive layer (b) and the layer of carbon (c).

Kuroiwa discloses a moisture sensor device comprising a single layer of a moisture sensitive polymer sandwiched between two electrodes. Kuroiwa further describes that the device can have multiple moisture sensitive polymer layers sandwiched between multiple sets of electrodes. However, Kuroiwa simply does not teach or suggest an olfactory sensor of the present invention that being an olfactory sensor comprising two layers, a conductive material layer and a non-conducting/or insulating polymer film layer.

Applicants teach an olfactory sensor that can detect odorants, such as organic molecules in a gaseous or vapor liquid composition. Applicant submit that one skilled in the art would not have been motivated by the disclosures of the cited art to arrive at the present invention. As such, Applicants respectfully request that the rejection of claims be withdrawn.

2. Prior Art References Does Not Teach or Suggest All the Claim Limitations

Applicants assert that none of the cited references, alone or in combination, teach or suggest the claimed invention. The Examiner appears to concur with Applicants in this regard. The Examiner states:

> Yamagishi et al. (5,756,879), Pace (4,454,007 or Kuroiwa et al. (5,296819) fail to teach some of the claimed limitations.

However, the Examiner alleges that Yamagishi teaches that the conductive material can include carbon up to a thickness of 2 microns (*see*, column 6, lines 10-15, Yamagishi). However, it is Applicants' understanding of the cited passage that Yamagishi does not teach or suggest that a conductive material can include carbon as is taught and claimed in the present invention. Instead, Yamagishi describes that the **electrodes themselves** can be made of a

conductive material, preferably gold but also platinum, palladium and carbon. As recited in column 6, lines 8-15 of Yamagishi:

> **An example of a metal that has been successfully used for the electrodes 14a, 14b is gold**, which has been formed over a tungsten-titanium alloy, the alloy serving to provide good adhesion of the gold to a glass substrate 12. **Other suitable conductive materials include platinum, palladium and carbon**. As with gold, an adhesion layer, employing any of the well-known adhesion layers may be employed in conjunction with the metal electrodes 14a, 14b. Preferably the electrodes 14a, 14b comprise gold in the practice of the invention.

The foregoing passage is **not** a teaching of "a) depositing a first layer of conducting material onto said substrate having a pair of electrodes," as is currently set forth in Claim 1.

The Examiner further alleges that Kuroiwa teaches covering the electrode layers with a polymer film (*see*, column 3, lines 10-20). However, Kuroiwa does not teach or suggest covering the electrodes with a **non-conducting/or insulating** polymer as is taught in the present invention. Instead, Kuroiwa describes that a **moisture sensitive** polymer film is *sandwiched* between a lower and upper electrode. As recited in column 3, lines 11-23 of Kuroiwa:

> Referring to FIG. 1, reference number 1 denotes a square insulating substrate made of alumina, glass, a thermal silicon oxide, or the like; 2, **a lower electrode** consisting of platinum or the like and **formed on the upper surface of the insulating substrate** 1; and 3, **a moisture sensitive film** (hereinafter referred to as a moisture sensitive film) **coated on the lower electrode** 2 by, e.g., spin coating or dipping organic polymer resin. The moisture sensitive film 3 is made of a moisture sensitive material such as cellulose, acetate, butyrate polyimide, or acrylic resin. Reference numeral 4 denotes **an upper electrode** made of, e.g., gold, and **formed on the lower moisture sensitive film**.

Pace simply does not supply the deficiencies of the other references. Pace discloses a sensor for detecting inorganic ions in a liquid sample substantially consisting of four layers. In addition to the four layers, the reference half cell also comprises a salt bridge.

In view of the above, Applicants submit that the combination of Yamagishi, Kuroiwa, and Pace, simply does not teach or suggest all the elements of the invention. As such,

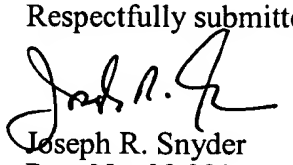
Applicants respectfully request that the Examiner withdraw all rejections and send this application to issue.

VI. CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 925-472-5000.

Respectfully submitted,



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